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NUEXCO

JUNE 1984 NUMBER 190

Monthly Report on the Nuclear Fuel Market

NUEXCO

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MONTHLY REPORT ON THE NUCLEAR FUEL MARKET

June 1984 No. 190

R. WESLEY MILLER, *EDITOR* JAMES J. LIGHTNER, *ASSOCIATE EDITOR*

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NOTICE

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NATURAL URANIUM AND CONVERSION

The **Exchange Value** as of May 31, 1984 is **$17.75** per pound U_3O_8, unchanged since last month. The *Current Market Data* section of this Report lists nine uranium sales transactions, involving a total of approximately 3.5 million pounds U_3O_8 *equivalent*. All nine involve deliveries prior to 1986.

Active supply of uranium (U_3O_8 and UF_6) for spot and near-term delivery totals **5.2 million** pounds U_3O_8 or equivalent UF_6, down 2.2 million pounds since last month. The corresponding figure for **active demand** is **2.4 million** pounds, down 1.0 million pounds. The spot and near-term **supply-demand ratio** remains 2.2:1.

The **Transaction Value** as of May 31, 1984 is **$17.00** per pound U_3O_8, down $0.90 since last month. The current Transaction Value includes 17 transactions involving a total of 3.8 million pounds U_3O_8 or equivalent UF_6 and covers a period of 3 months.

The **Loan Use Charge Rate** as of May 31, 1984 is **6 percent** per annum, unchanged since last month. No uranium loans are reported.

* * *

The market for natural uranium was somewhat more active in May than in April. While some sellers continued to await a significant rise in prices, a number chose to conclude business at current prices rather than wait and hope for improved market conditions. As has been the case for several months, the most active sellers were holders of natural UF_6, while less competitive offers came from high-cost producers and other sellers of concentrates.

The near-term supply of natural uranium dropped by 2.2 million pounds U_3O_8 equivalent during May, largely as a result of recent sales from natural UF_6 inventories. Currently more than half of active supply is made up of natural or enriched UF_6 held by two sellers. Approximately half of the current near-term demand comes from discretionary buyers interested in prices similar to those paid during March, while the other half is firm utility demand for which sellers are likely to compete vigorously over the coming weeks.

* * *

The **Conversion Value** is unchanged at **$0.80** per pound U in UF_6. One secondary market conversion transaction is reported, involving approximately 650 thousand pounds U in UF_6; that transaction had been pending for several months. Another conversion transaction involving a primary market seller was concluded during May at a price competitive with prices available in the secondary market. It was the first conversion transaction of which Nuexco is aware in which a primary supplier had in effect competed with secondary market prices. That trend has been characteristic of the *enrichment* market for several months.

The Conversion Value of $0.80 continues to represent the approximate level of sellers' offering prices. Nuexco is not aware of any active demand for secondary market conversion services; it is for that reason that sellers of natural UF_6 are making offers that assign zero or less value to the conversion component of their material. By matching or undercutting offers from sellers of concentrates, natural UF_6 sellers are able to attract the interest of buyers desiring U_3O_8 for use as feed for primary conversion commitments.

SECONDARY MARKET ENRICHMENT SERVICES

The secondary market **SWU Values** as of May 31, 1984 are unchanged since last month: **$105** for **DOE origin** and **FY85 delivery; $80** for **non-DOE origin** and delivery within approximately 15 months. The *Current Market Data* section of this Report lists five secondary market SWU sales involving a total of 750 thousand SWUs. Two of the reported transactions were sales of enriched UF_6. Active secondary market supply of enrichment services totals approximately 1.2 million SWUs, down 500 thousand SWUs, while active demand amounts to 1.0 million SWUs, up 400 thousand SWUs. The drop in supply is attributable mainly to the completion of sales by one major inventory holder, while the rise in demand is attributable to a few utilities that are likely to sign the USEC.

Despite a substantial drop in the ratio of SWU supply to demand, most utilities, including the Requirements contract holders that comprise most of the demand for DOE origin SWUs, are still assessing enrichment alternatives. The gap between DOE origin and non-DOE origin SWU prices continues to cause hesitation among utilities considering conversion to the USEC.

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CURRENT MARKET DATA

May 31, 1984	Market Values	Active Supply[1] (thousands)	Active Demand[1] (thousands)
EXCHANGE VALUE	**$17.75**/lb. U_3O_8	5,225	2,395
CONVERSION VALUE	**$0.80**/lb. U in UF_6	2,930	0
SWU VALUES			
DOE origin, FY85 delivery	**$105**/SWU	1,185	1,040
non-DOE origin, delivery within 15 months	**$80**/SWU		
LOAN USE CHARGE RATE	6%/annum	7,045	750

TRANSACTION VALUE	$/lb. U_3O_8	Millions of Pounds	Number of Transactions	Number of Months
	17.00	3.8	17	3

[1]Supply and demand tables in the *Current Market Data* section of this Report detail the numbers for each category. Quantities of SWUs (Separative Work Units) are not referenced to a particular origin.

DEFINITIONS

1. The **Exchange Value** is Nuexco's judgment of the price at which transactions for significant quantities of natural uranium concentrates could be concluded as of the date indicated.
2. The **Conversion Value** is Nuexco's judgment of the price at which spot and near-term transactions for significant quantities of conversion services could be concluded in the secondary market as of the date indicated.
3. The **SWU Values** represent Nuexco's judgment of the price at which transactions for the sale of significant quantities of SWUs of stated origin for delivery in the specified time period could be concluded as of the date indicated.
4. The **Loan Use Charge Rate** is Nuexco's judgment of the annual interest rate at which uranium loans could be concluded as of the date indicated.
5. The **Transaction Value** is a weighted average price of recent natural uranium sales transactions. The calculation is based on prices paid in:
   a. Transactions closed within the previous three-month period for which delivery is scheduled within one year of the transaction date;
   b. At least ten transactions;
   c. Transactions involving a sum total of at least 2 million pounds U_3O_8 equivalent.

   The sample time is extended as necessary to include these minima. Other currencies are converted to US dollars using conversion rates in effect on or near the transaction date.

DERIVATIONS AND COMMENTS

1. All Market Values are based on:
   a. Data from recently completed transactions.
   b. Data from pending transactions.
   c. Firm bids to buy or borrow, and firm offers to sell or lend.
   d. Prices purchasers or rates borrowers have expressed a willingness to pay, but for which Nuexco is not aware of firm bids to buy or borrow, and prices sellers or rates lenders have expressed a willingness to offer, but for which Nuexco is not aware of firm offers to sell or lend.
2. Prices associated with deliveries under old or renegotiated contracts or other than arm's-length transactions are not considered in the determination of these Market Values.
3. In the determination of the Conversion Value, Nuexco does not consider transportation charges other than those customarily provided by primary suppliers of conversion services.
4. The prices of conversion services or SWUs delivered under long-term contracts with primary suppliers are not considered in the determination of either the Conversion Value or SWU Value.
5. For the SWU Values, Nuexco converts SWU prices at varying tails and product assays to equivalent SWU prices at the DOE Reference Transaction Tails Assay (presently 0.20 weight-percent U_{235}) and a product assay of 3.0 weight-percent U_{235}, assuming feed costs corresponding to Nuexco's Exchange and Conversion Values determined as of the same date.
6. In calculating the Transaction Value, Nuexco does not account for the price of uranium delivered in connection with contracts which call for "market price" mechanisms. This exclusion applies particularly to contracts in which delivery prices are expressed as a function of future Exchange Values or any other indeterminant variable. Also excluded from the calculation are any other transactions in which the delivery price is defined in such a way that it cannot currently be determined.

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CURRENT MARKET DATA

EXCHANGE VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb. U_3O_8 in Concentrates			per kg. U in Concentrates		
	This Month (May 31, 1984)	Last Month (Apr. 30, 1984)	12 Months Ago (May 31, 1983)	This Month (May 31, 1984)	Last Month (Apr. 30, 1984)	12 Months Ago (May 31, 1983)
Australia (dollar)	19.74	19.30	26.60	51.33	50.18	69.17
Belgium (comm. franc)	986.66	973.14	1,181	2,565	2,530	3,070
Canada (dollar)	22.97	22.73	28.90	59.72	59.10	75.13
Finland (markka)	102.84	101.66	128.63	267.36	264.30	334.40
France (franc)	148.91	147.43	176.96	387.13	383.27	460.05
FRG (mark)	48.51	48.01	59.02	126.12	124.82	153.43
Italy (lira)	29,963	29,697	35,075	77,897	77,206	91,186
Japan (yen)	4,107	4,020	5,589	10,677	10,452	14,529
Netherlands (guilder)	54.72	54.12	66.44	142.25	140.69	172.73
South Africa (rand)	22.73	22.12	25.28	59.09	57.50	65.71
Spain (peseta)	2,726	2,696	3,264	7,087	7,010	8,485
Sweden (krona)	143.49	141.21	176.69	373.05	367.11	459.36
Switzerland (franc)	40.12	39.64	48.88	104.31	103.05	127.07
UK (pound)	12.81	12.66	14.65	33.29	32.90	38.08
US (dollar)	17.75	17.75	23.50	46.15	46.15	61.09

TRANSACTION VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb. U_3O_8 in Concentrates			per kg. U in Concentrates		
	This Month (May 31, 1984)	Last Month (Apr. 30, 1984)	12 Months Ago (May 31, 1983)	This Month (May 31, 1984)	Last Month (Apr. 30, 1984)	12 Months Ago (May 31, 1983)
Australia (dollar)	18.91	19.46	25.30	49.16	50.60	65.78
Belgium (comm. franc)	944.97	981.36	1,123	2,457	2,551	2,920
Canada (dollar)	22.00	22.93	27.48	57.20	59.60	71.45
Finland (markka)	98.49	102.52	122.33	256.06	266.53	318.04
France (franc)	142.62	148.67	168.30	370.77	386.51	437.54
FRG (mark)	46.46	48.42	56.13	120.79	125.87	145.92
Italy (lira)	28,697	29,948	33,358	74,605	77,858	86,724
Japan (yen)	3,933	4,054	5,315	10,226	10,540	13,818
Netherlands (guilder)	52.40	54.57	63.19	136.24	141.88	164.28
South Africa (rand)	21.77	22.31	24.04	56.59	57.99	62.50
Spain (peseta)	2,611	2,719	3,104	6,788	7,069	8,070
Sweden (krona)	137.43	142.40	168.05	357.29	370.21	436.88
Switzerland (franc)	38.43	39.97	46.49	99.90	103.92	120.85
UK (pound)	12.27	12.76	13.93	31.89	33.18	36.21
US (dollar)	17.00	17.90	22.35	44.20	46.54	58.11

[1]Calculated using currency exchange rates published in the *Wall Street Journal* on May 31, 1984.

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CURRENT MARKET DATA

CONVERSION VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb. U as UF_6			per kg. U as UF_6		
	This Month (May 31, 1984)	Last Month (Apr. 30, 1984)	12 Months Ago (May 31, 1983)	This Month (May 31, 1984)	Last Month (Apr 30, 1984)	12 Months Ago (May 31, 1983)
Australia (dollar)	0.89	0.87	1.36	1.96	1.92	3.00
Belgium (comm. franc)	44.47	43.86	60.30	98.04	96.69	132.94
Canada (dollar)	1.04	1.02	1.48	2.28	2.26	3.25
Finland (markka)	4.64	4.58	6.57	10.22	10.10	14.48
France (franc)	6.71	6.64	9.04	14.80	14.65	19.92
FRG (mark)	2.19	2.16	3.01	4.82	4.77	6.64
Italy (lira)	1,350	1,338	1,791	2,977	2,951	3,949
Japan (yen)	185.10	181.20	285.37	408.07	399.48	629.14
Netherlands (guilder)	2.47	2.44	3.39	5.44	5.38	7.48
South Africa (rand)	1.02	1.00	1.29	2.26	2.20	2.85
Spain (peseta)	122.87	121.53	166.67	270.88	267.92	367.44
Sweden (krona)	6.47	6.36	9.02	14.26	14.03	19.89
Switzerland (franc)	1.81	1.79	2.50	3.99	3.94	5.50
UK (pound)	0.58	0.57	0.75	1.27	1.26	1.65
US (dollar)	0.80	0.80	1.20	1.76	1.76	2.65

SWU VALUES EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	DOE SWU FY85	Non-DOE SWU delivery within 15 months
Australia (dollar)	116.80	88.99
Belgium (comm. franc)	5,837	4,447
Canada (dollar)	135.89	103.53
Finland (markka)	608.34	463.50
France (franc)	880.87	671.14
FRG (mark)	286.96	218.64
Italy (lira)	77,245	135,044
Japan (yen)	24,294	18,510
Netherlands (guilder)	323.67	246.61
South Africa (rand)	134.44	102.43
Spain (peseta)	16,127	12,287
Sweden (krona)	848.83	646.73
Switzerland (franc)	237.34	180.83
UK (pound)	75.76	57.72
US (dollar)	105.00	80.00

[1]Calculated using currency exchange rates published in the *Wall Street Journal* on May 31, 1984.

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RECENT TRANSACTIONS[1]

Uranium Sales

Nuexco Transaction Number	Delivery Period	Approximate Quantity (thousands of pounds, U_3O_8 equivalent)	Approximate Price as Percent of Current E.V.	Seller	Buyer	Remarks
2990	1984	50-100	101	unknown	US Utility	
2988	1984	301-600	97	US Entity	European Utility	UF_6. See footnote 5.
2986	1984	50-100	99	European Producer	European Broker	UF_6. See footnote 5.
2978	1984	101-300	101	Producer	US Utility	
2977	1984	101-300	104	Canadian Producer	European Entity	
2972A	1985	301-600	94	European Entity	European Utility	Enriched UF_6. Calculation assumes 0.2 tails.
2969	1985	301-600	102	European Entity	European Utility	UF_6. See footnote 5.
2816	1984	601-1,000	93	Canadian Producer	European Utility	UF_6. See footnote 5.
2813A	1984	601-1,000	see remarks	US Utility	US Utility	Fabricated fuel. Substantially discounted.

(See following page for footnotes.)

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CURRENT MARKET DATA

RECENT TRANSACTIONS[1] *(continued)*

Secondary Market Conversion Services

Nuexco Transaction Number	Delivery Period	Approximate Quantity (thousands of pounds, U equivalent)	Approximate Price as Percent of Current C.V.	Seller	Buyer	Remarks
2672	1984-85	601-1,000	73	US Utility	European Utility	Deconversion and origin swap.

Secondary Market Enrichment Services

Nuexco Transaction Number	Delivery Period[2]	Approximate Quantity (thousands of SWUs)	Approximate Price[3] as Percent of Current SWU Value[4]	Tails Assay (Percent U^{235})	Seller Group	Buyer Group	SWU Origin	Remarks
2972B	1985	101-300	99	see remarks	European Entity	European Utility	Eurodif	Enriched UF_6. Calculation assumes 0.2 tails.
2970	1985-88	101-300	107 (see remarks)	to be determined	European Entity	European Utility	Eurodif	Refers to 1985 deliveries only.
2834	1985	50-100	84	to be determined	European Entity	European Utility	Eurodif	Amendment to existing contract.
2833	1984	50-100	unknown	unknown	US Utility	US Utility	DOE	
2813B	1984	101-300	unknown	unknown	US Utility	US Utility	DOE	Fabricated fuel.

[1] Transactions listed are not limited to those in which Nuexco was involved, but also include others of which Nuexco is aware.
[2] Refers to calendar year, not fiscal year.
[3] Price is not normalized to 0.20% tails assay.
[4] Refers to SWU Value for same origin as SWUs included in transaction.
[5] Price calculation assumes conversion component has no value. See *Pricing* section.

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CURRENT MARKET DATA

URANIUM SUPPLY
(As of 5/31/84)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale:			
ACTIVE			
1575	—	500 per year	
1818	—	500 per year	1985-90
2038	1,000	—	UF_6
2134	220	—	
2201	95	—	
2236	—	200 per year	1985-89
2263	—	500 per year	1985-90
2275	145	—	
2297	—	200 per year	1985-89
2335	275	—	
2336	—	250 per year	
2365	20	—	
2368	—	2,800	
2376*	200	—	
2389	300	—	
2390	100	—	
2392	35	—	UF_6
2436 A	850	—	enriched UF_6
2484	130	—	
2489*	—	500	1986-90
2505	280	—	U_3O_8 or UF_6
2509*	1,175	1,630	UF_6
2565	400	—	
TOTAL:	5,225		
INACTIVE			
0564	—	1,000 per year	1985-90
2017	1,100	1,200	
2191	125	—	UF_6
2193	—	800 per year	1986-90
2271	—	500 per year	1984-88
2326*	—	3,500	1988-91
2429	450	—	
2473	—	500 per year	1984-90
2514*	—	1,000 per year	
2553*	300	—	
2557*	570	—	UF_6
TOTAL:	2,545		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 2483A, 2320, 2315, 2307.

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CURRENT MARKET DATA

URANIUM DEMAND
(As of 5/31/84)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Inquiries to Purchase:			
ACTIVE			
2217	—	1,000 per year	1988-95
2329	—	500	1985
2352	240	—	
2355 A	—	1,400	enriched UF_6
2419*	60	—	UF_6
2442*	—	250 per year	1986 on
2445	—	250 per year	1988-93
2456	650	—	UF_6
2463	260	—	UF_6
2494*	450	250	1985
2558	235	—	UF_6
2566	500	—	
TOTAL:	2,395		
INACTIVE			
1999	—	50 per year	1985-90
2244	—	350 per year	
2372	—	250 per year	1985-88
2413	—	250 per year	1986-88
2414	—	150 per year	1987-91
2457	—	650	1987
2542A*	1,400	—	enriched UF_6
TOTAL:	1,400		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 2508, 2492, 2481, 2411, 2399, 2303.

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LOAN SUPPLY AND DEMAND
(As of 5/31/84)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Within 1 Year	Beyond 1 Year	Remarks
Available for Loan:			
ACTIVE			
1938	2,000	—	UF_6
2128*	2,500	—	
2139	2,000	—	
2483	545	—	
TOTAL:	7,045		
Inquiries to Borrow:			
ACTIVE			
2453*	250	—	
2493	500	—	
TOTAL:	750		

CONVERSION SUPPLY AND DEMAND
(As of 5/31/84)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U as UF_6) Within 3 Years	Beyond 3 Years	Remarks
Available for Sale:			
ACTIVE			
2051	1,000	—	
2141	2,600	—	
2511	330	330	1986-90
TOTAL:	2,930		
INACTIVE			
1936	1,000	—	
2401	600	—	
2438	220	220	1985-87
TOTAL:	1,820		

*New or revised since last month.
[1]Measured from the date of this Report.

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CURRENT MARKET DATA

SWU SUPPLY
(As of 5/31/84)

Nuexco Project Number	Delivery Period[1] (Thousands of SWUs) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale: ACTIVE			
2100	—	100 per year	1986-87
2192	100	210	1986-87
2285*	—	1,500	
2345	150	—	
2351*	—	250	1986-88
2378	130	250	1987-88
2408*	100	60	1986
2428	80	—	
2436B*	225	—	enriched UF_6
2469	—	80	1987
2510	400	—	
TOTAL:	1,185		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes SWUs deliverable within one year under other than spot or near-term contracts.

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SWU DEMAND
(As of 5/31/84)

Nuexco Project Number	Delivery Period[1] (Thousands of SWUs) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Inquiries to Purchase:			
ACTIVE			
2237*	—	400 per year	1987-88
2355B	—	600	enriched UF_6
2400	80	—	
2407	75	130	1986
2412	85	—	
2432A*	50	—	
2443*	150	—	
2448	20	—	
2452	30	—	1985
2454*	75	75	1986
2475	300	300 per year	1988-90
2503	—	330	1986
2518*	—	160	1987
2519*	—	30 per year	1987 on
2520*	120	—	
2522*	20	—	
2552	35	—	
TOTAL:	1,040		
INACTIVE			
2142	35	—	
2432B*	—	30 per year	1987 on
2440	—	20 per year	1988-91
2449	50	—	
2459	50	50 per year	
2471	60	40 per year	
2512	—	15 per year	1987 on
2542B*	340	—	enriched UF_6
2543*	—	25 per year	1987 on
2567	—	45 per year	1987 on
TOTAL:	535		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes SWUs deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 2491, 2346.

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RECENT DEVELOPMENTS

AUSTRALIA

At the end of May the Australian Science and Technology Council (ASTEC) submitted to the government the results of its official inquiry, entitled "Examination of the Issues Surrounding Australia's Role in the Nuclear Fuel Cycle." The government commissioned the ASTEC inquiry in November 1983 as one of the cornerstones of the Australian Labor Party's (ALP) uranium policy (see the *Annual Review* of Australia on page 18 of Report 187). That policy will be reviewed at the ALP's national conference in July, and the ASTEC report is to provide the scientific basis for debate among opposing factions of the Party.

The ASTEC Report was published on May 31, shortly before this article went to press. Nuexco has learned that the report strongly advocates a more participatory role by Australia in all aspects of the nuclear fuel cycle. It argues that greater involvement will place Australia in a better position to influence the non-proliferation of nuclear weapons, as well as the safe use of nuclear power. The report suggests that Australia consider developing domestic programs for uranium enrichment and spent fuel reprocessing in addition to expanding research on radioactive waste management.

The tone of the ASTEC report corresponds closely with recent policy pronouncements by several key ministers in the Australian government. The Minister of Resources and Energy, Mr. Walsh, proposed a draft uranium policy in March based on the premise that "Australia's ability to contribute to the reduction of the risks and hazards [associated with nuclear materials and technologies] will be enhanced if Australia continues to participate, as a uranium exporter, in the nuclear fuel cycle." The Foreign Minister, Mr. Hayden, recently stated that Australia, as a signatory to the nuclear Non-proliferation Treaty (NPT), has a moral obligation to supply uranium to nations having nuclear power programs. Australia's refusal to export counters the spirit of cooperation on which the treaty is founded, and forces purchaser nations to consider uranium suppliers that may have less concern than does Australia for the issues surrounding the nuclear fuel cycle.

In years past, and still among certain factions on the left of the ALP, the argument that Australia should be a moral leader in the uranium business had been construed negatively to mean that the nation should stay out of the business altogether. The new approach appears to be creating the most favorable climate for the Australian uranium industry in a decade. Government leaders seem to have realized the adverse economic implications of the ALP's existing policy, which includes provisions banning uranium exports to France and prohibiting the exploitation of undeveloped deposits (other than the Olympic Dam copper-uranium project).

The ban on uranium exports to France, specifically affecting an existing contract between Queensland Mines Ltd. (QML) and Electricite de France (EDF) calling for a large delivery at the end of this year, was a politically-inspired action in protest of French nuclear weapons testing in the Pacific Ocean. France, one of the world's major nuclear weapons states, has threatened to retaliate for the Australian embargo by curtailing other energy-related trade between the two nations. EDF is not dependent on the QML shipments, so the only real effect of the ban has been to jeopardize Australia's trade relations with France, and possibly other Common Market nations as well.

Thus, as the ALP prepares for its conference next month, industry observers outside Australia can expect the Party to modify its existing uranium policy along more pragmatic lines. The ASTEC report, recent policy pronouncements by senior government officials, and economic realism all suggest that policy revisions favorable to the uranium industry are imminent. The remaining *political* question is the extent to which Prime Minister Hawke and his supporters can obtain the support of the anti-uranium factions of the Party for the emergent centrist position. However, a more important *commercial* uncertainty is whether favorable political developments may be coming too late for a market that has undergone basic structural changes.

CANADA

Uranium production from Key Lake during April 1984 amounted to nearly 900,000 pounds U_3O_8, 90 percent of the project's rated monthly capacity of 1 million pounds. That level is the most yet produced at Key Lake, from which shipments started in October 1983, and could be the largest monthly quantity ever produced by a single operation. (Rossing in Namibia, which has produced on the order of 10 million pounds U_3O_8 per year, may have exceeded the 900,000 pound level in some months.) The mill was shut down for the first two weeks in May for modifications, resuming production on May 16. While other modifications will be made to the crushing circuit

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over the next few weeks, the operators anticipate no further interruptions in production, so output should be near capacity during the second half of the year.

The recent modifications in the mill and the ongoing modifications to the crushing and grinding circuit have been necessitated by unexpectedly high clay content in the ore. Mill throughput during the first few months of operation was well below capacity because of the clay problem. In addition, the existence of large amounts of groundwater in the project vicinity indirectly hindered the buildup to capacity. Water from the pit and surrounding wells is pumped into site reservoir number 2, which feeds the mill; the slowed rate of mill operation contributed to some overflow of the reservoir. One large spill early in January (some 27 million gallons), caused by an employee's failure to shut off a pump, received a great deal of publicity from the press. Reservoir number 2 has been back in operation since early April.

* * *

Ontario Hydro's Pickering units 1 and 2, which were shut down respectively in November and August of 1983 following the discovery of cracks in a number of pressure tubes, are undergoing preparatory work for complete retubing. The utility expects the units to resume commercial operation in 1987. The decision to proceed with retubing followed metallurgical tests indicating that as many as one-third of the zirconium-2 alloy pressure tubes in the two units could have sagged into contact with heavy-water calandria coolant channels, making them susceptible to rupturing. The existing tubes will be replaced with zirconium-nobium tubes, which are less prone to cracking.

Ontario Hydro operates nine other Candus and is building seven more; all sixteen of those units contain, or will contain, the superior type of pressure tube. After examining pressure tubes from Pickering unit 3 and one of Ontario Hydro's Bruce units, Atomic Energy of Canada Ltd. concluded that retubing of other Candus would not be necessary. However, Ontario Hydro plans to re-position garter springs, which separate pressure tubes from coolant channels, in all units that are operating or in the advanced stages of construction. The spring re-positioning is likely to delay by several months the commercial operation of the nearly-completed Bruce units 5 and 6. Another result of the Candu upgrading program will be higher electricity bills for Ontario's consumers. Replacement power from the utility's coal-fired plants costs 84 percent more than nuclear-generated electricity.

PEOPLE'S REPUBLIC OF CHINA

The government of the People's Republic of China (PRC) has concluded a number of agreements with Western governments recently that define a framework for trade in nuclear energy-related goods and services. The extent to which trade actually develops will depend on a number of forthcoming policy decisions by the Chinese government. While the government has announced a tentative nuclear generating capacity target of 10,000 MWe by the year 2000, it has not yet decided on the nature of the foreign contribution to achieve that goal.

Commercial Agreements

The most publicized nuclear trade agreement reached between the PRC and a Western government recently was that signed by Premier Zhao Ziyang and President Reagan early in May, during the US leader's state visit to the PRC. The agreement allows US companies to bid on future Chinese nuclear power projects. Under the terms of the US Atomic Energy Act, a nuclear cooperation pact must be reviewed by the US Congress for 60 days without rejection before the President can sign it into law. Because of the potential benefits for the USA of participation in the Chinese market, Congress is unlikely to reject the pact. In the near future, a high-level Chinese mission will visit the USA to continue trade discussions.

A number of US companies involved in nuclear-related businesses, including all of the major US reactor vendors and some US utilities with cancelled plants (notably the Tennessee Valley Authority and the Washington Public Power Supply Service), are actively seeking sales in the PRC. Many promoted their goods at the American Nuclear Society's nuclear technology exhibition in Beijing in mid-May. Companies in related businesses are establishing operations in the PRC as well. For example, Occidental Petroleum recently entered into a $580 million joint coal mining venture with the Chinese, and Bechtel Corporation announced a major expansion of its China operations.

The PRC has concluded nuclear trade agreements similar to the pact with the USA with the Federal Republic of Germany, France, Italy, Canada, Brazil, and Japan. Prime Minister Nakasone of Japan visited the PRC shortly before Mr. Reagan, and Japan has offered to the Chinese an attractive economic aid package totalling several hundred billion yen in loans for the development of industrial infrastructure. The Chinese have asked several Japanese companies to participate in energy development projects, including Mitsubishi Heavy Industries, C. Itoh, Niigata Electric, Nippon Steel and Nippon Electric.

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Mitsubishi (a Westinghouse licensee) recently won a pressure vessel supply contract for the PRC's first nuclear power unit, a 300-MWe PWR in the early stages of construction at Quinshan near Shanghai, in Jiangsu province. Power Reactor and Nuclear Fuel Development Corp. (PNC) is cooperating with the PRC on a three-year joint uranium exploration program.

The PRC currently is negotiating various supply contracts, primarily with General Electric of the UK, Framatome, EDF (Electricite de France) and Cogema, for the planned twin 900-MWe PWR plant to be located approximately 50 miles north of Hong Kong at Daya Bay in Guangdong province. The Daya Bay project is a joint venture of the PRC (75 percent) and a consortium of Hong Kong interests (25 percent); 70 percent of the future power from the units will be sold to Hong Kong. Thus, while the PRC is coordinating the Daya Bay project, it will not necessarily be a prototype for future Chinese nuclear power projects.

Debate Over Nuclear Power

The PRC appears to have made a firm commitment to the development of nuclear power. Coal-fired plants presently produce some 70 percent of the country's power, while hydro plants produce most of the balance. Coal is abundant in the Chinese hinterland (the PRC has the world's largest coal reserves), but costs are high to transport it to more populous regions, and the government is wary of the risks associated with dependence on long transportation lines. Furthermore, existing coal plants are not equipped with scrubbers or electrostatic precipitators, and pollution has become a serious problem in industrial centers. Most of the country's tremendous hydroelectric potential, like its coal, is located far from the regions where its use is most needed, so much goes unused.

The current government has placed strong emphasis on the modernization of the economy in order to maintain a rate of economic growth capable of sustaining China's vast population. An increasing shortage of power in the main population centers is restricting economic expansion. Construction of several new nuclear plants over the next decade and a half is a vital part of national economic strategy.

There is, however, an ongoing debate within the government over the proper mix of foreign and domestic contributions to the development of nuclear power. Traditionally, the PRC has shunned foreign investment on both ideological and economic grounds. Reluctant to make any concessions that might in any way undermine its sovereignty, the government has for the most part limited economic arrangements with foreigners to project-specific technical assistance; such practices as open bidding and turnkey performance have been rare. While the current regime's recent arrangements with Western nations reflect a new flexibility, the government has yet to decide on the proper structure for the domestic program. The Vice Premier, Li Peng, and three ministries (Water Resources and Electric Power, Nuclear Industry, and Machine Building) are involved in nuclear power policy, and all appear to have conflicting interests with regard to such issues as technology transfer, involvement of Chinese industry and personnel, and debt financing.

Officials have indicated that they are leaning toward the use of 1000-MWe PWRs for the domestic program, and the 300-MWe PWR under construction at Quinshan may act as an important training ground for the Chinese. It is not clear that the choice of reactor technology for the larger program is final, however. For several years the Ministry of Nuclear Industry has operated a number of nuclear power research institutes and experimental facilities that supplement the PRC's large nuclear weapons program. In the past, nuclear power research was particularly active in the development of heavy-water reactor technology. Research has been accelerated in recent years and expanded to include breeder technology and fusion. The Chinese could decide to use foreign assistance merely to supplement technological progress they have already achieved.

Far greater uncertainty surrounds the question of the PRC's eventual participation in the nuclear fuel market. The precise extent of the country's uranium supply situation and recovery capability is not well known to the Western world. However, the PRC does have substantial uranium reserves (estimated at around 800,000 tonnes U_3O_8), a Bureau of Uranium Geology having a large staff, and a production rate adequate to supply military requirements and at least one or two small foreign supply contracts (one with a Japanese buyer). To feed the domestic nuclear power program the Chinese could choose to increase domestic production or to purchase uranium abroad, or a combination of methods. Whether or not enrichment needs would arise would depend on the choice of reactor technology for the national program, and any plans the government might formulate to expand domestic enrichment capacity beyond military requirements.

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UNITED STATES

In a sudden development at the end of May, UNC Resources, Inc. and General Atomic Company (now called GA Technologies, Inc., a wholly-owned subsidiary of Gulf) settled their longstanding (since 1975) legal dispute over uranium contracts. The settlement, which UNC valued at $300 million, ended what probably will be the last in the long series of antitrust litigations related to the Westinghouse uranium case.

It included three parts:

1. General Atomic's parent company, Gulf Corporation, recently acquired by Standard Oil Company of California (Socal), paid UNC $130 million on May 31.

2. Gulf assumed UNC's obligation (valued at $71 million by UNC) to repay to Pacific Gas and Electric Company (PG&E) some 2.3 million pounds U_3O_8 which UNC had borrowed.

3. Socal agreed to pay $100 million for unissued common stock in UNC. The price per share will be based on the highest average monthly price of UNC's common stock over the next six months, but subject to a maximum and a minimum such that Socal will acquire 5–8 million shares, at least 26 percent of UNC. Socal agreed further not to acquire any additional shares within the next three years without UNC's permission, and said that it is making the investment for investment purposes only. Finally, while Socal has not yet decided whether to seek a seat on the UNC Board of Directors, it did agree to vote the shares proportionately with other stockholders on most matters.

The settlement was, in Nuexco's opinion, prompted by the coincidental juxtaposition of three events.

1. On May 10, 1984, a New Mexico District Court found General Atomic Company (and its partners Gulf Oil Corporation and Scallop Nuclear, Inc.) liable to United Nuclear Corporation (a subsidiary of UNC Resources) for damages resulting from GAC's attempts to enforce (through litigation and arbitration) uranium contracts voided in 1978, when the New Mexico court found that participation by General Atomic and Gulf in an international uranium cartel had violated antitrust laws. UNC's original suit had been filed in 1975, and when GAC continued to try to enforce the original contracts, even after they were voided in 1978, UNC filed another suit in 1982, claiming $1 billion in consequential damages. A jury trial to determine the amount of damages to be awarded in that case, including the questions of treble damages and punitive damages, had begun during the week of May 21, but had been halted on May 25, pending the outcome of negotiations toward an out-of-court settlement.

2. The first portion of UNC's uranium loan (1,129,000 pounds U_3O_8) was due to be repaid to PG&E on July 1, 1984, and UNC almost certainly would have had to default.

3. Socal's acquisition of Gulf in the spring of this year must have had the effect of changing management attitudes at Gulf, formerly quite opposed to a settlement. It is reasonable to conclude that management became concerned about the possible consequences if UNC won a judgment for even a relatively small portion of the $1 billion they had sought. With treble damages and punitive damages also at issue, Socal/Gulf management could have been looking at a potential liability of $3 billion or more. Such a liability would have strained even their vast resources.

Thus, PG&E's loan repayment is assured by the financial strength, inventories and uranium production capacity of the huge Gulf-Socal combine, while UNC, having rid itself of this repayment obligation, is essentially out of the uranium business.

While this chapter of this complex litigation is closed, another is on the verge of opening. It is likely that Uranerz Canada Limited and Uranerz Exploration and Mining Limited will sue UNC over the uranium supply contract which UNC unilaterally abrogated earlier this year. That contract, concluded in 1981, was to have provided the 2.3 million pounds U_3O_8 with which UNC had intended to repay its PG&E loan. It is virtually certain that Uranerz will, at least, seek the difference between current low prices and the higher prices provided in the supply contract.

The UNC-Uranerz contract originally called for 4–5 million pounds U_3O_8, to be redelivered by UNC to the Tennessee Valley Authority (TVA) and to PG&E. All of the TVA material was delivered by Uranerz and paid for by UNC, but soon after the TVA deliveries were completed (deliveries on which UNC made a profit) UNC "gave notice of cancellation" of the portion of deliveries destined for PG&E (deliveries which would have required net cash outlay by UNC), citing "disagreements with the supplier."

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FINLAND

Introduction

Finland has exploited nuclear power remarkably successfully. Four operating units (Table 2) provide more than 40 percent of the nation's electricity, and nuclear electricity generation per capita is the highest in the world. Two utilities operate nuclear power plants, IVO (Imatran Voima Oy) and TVO (Teollisuuden Voima Oy). They have used different supply strategies to implement their programs: state-owned IVO has worked closely with the USSR, while privately-owned TVO has been supplied primarily through Western markets. For some time the utilities have considered joining forces to build a fifth nuclear unit. Their approach to that project is instructive of the economic lessons each has learned.

Finland is one of the Nordic nations bordering the Baltic Sea in northern Europe (Figure 1). It has a population of approximately 4.7 million, most of whom live in the South along the Baltic coast; all four nuclear power units are located on the southern coast. The country's dominant geographical considerations are its proximity to the Arctic and its long border with the USSR.

Energy Sources

Over the past decade nuclear energy has captured more than 40 percent of the nation's electricity market and 17 percent of primary energy consumption, largely at the expense of oil (Table 1). In addition to nuclear power's 40 percent, hydropower provides approximately 30 percent of electricity, while electricity-heat cogeneration projects using woodwaste, peat, coal and oil provide most of the remainder. Because of the country's wealth of timber and water resources, the government traditionally has promoted indigenous energy resources such as wood, hydropower, and peat. The national oil company Neste imports almost all crude oil from the USSR. Neste also markets natural gas obtained from the USSR through a pipeline across southeastern Finland, which began flowing in 1974. (Finland has a large trade surplus with the USSR despite substantial oil and gas imports.)

Nuclear Supplies

The Finnish utilities committed themselves to the commercial use of nuclear power in the early 1970s. At that time the country had some experience in the nuclear power field as a result of operating one research reactor (since 1962) and participating in various international nuclear power programs. Thus, while they were forced to use foreign vendors for all of their principal hardware supplies, both utilities participated extensively in the design and construction of their plants, absorbing directly approximately half of total costs.

Table 1

ENERGY CONSUMPTION BY SOURCE IN FINLAND[1]

Source	Percent Share 1973	Percent Share 1983
Oil	56	36
Nuclear	0	17
Wood, Etc.	19	15
Hydropower	11	13
Coal	9	9
Electricity Imports	5	5
Peat	0	3
Natural Gas	0	2
Total	100	100

[1]Source of Table: *European Energy Review*, May 18, 1984.

IVO ordered the main heavy components of its 445-MWe Loviisa units from Atomenergoexport of the USSR. Incorporating West German instrumentation and a Westinghouse-licensed condenser system, the state-owned utility managed construction of two hybrid Soviet PWRs. IVO purchases all fuel requirements and services for Loviisa from the USSR; the fuel package includes the return of spent fuel (after five years of storage), relieving the utility of the responsibility for long-term waste storage. Combining Finnish management with the Soviet supply package, IVO and Atomenergoexport are in a position to collaborate on reactor sales to third nations.

By contrast, TVO, which is a consortium of several Finnish utilities and industrial companies, ordered its two 660-MWe BWRs from Asea-Atom of Sweden (a General Electric licensee), and purchased the generators from Stal-Laval. TVO has long-term natural uranium supply contracts with Eldorado of Canada and Queensland Mines of Australia; Comurhex converts the Australian U_3O_8. Techsnabexport of the USSR supplies enrichment services to TVO, an arrangement attributable in part to the unavailability of other enrichment suppliers in the

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mid-1970s, when the utility made its fuel contracts. Asea-Atom and Kraftwerk Union provide fabrication services.

Despite choosing rather different supply approaches, IVO and TVO cooperate frequently in areas of common interest regarding nuclear power. Both utilities now have highly developed nuclear power capabilities. The government has been considering the construction of a fifth nuclear unit as one of the alternate means to fulfill an anticipated rise in electricity demand at the end of this decade. The likelihood of an order appears slim in the near future, in part because of the government's emphasis on the use of indigenous electricity sources, and partly because of Neste's gas and petroleum interests. However, IVO and TVO, which would pool resources to manage the fifth unit if it were ordered, requested Framatome and Atomenergoexport to bid on a proposed 1000-MWe unit in 1982. The utilities chose to request bids for the unit only from those two suppliers because of the strength and centrality of the French and Soviet nuclear power programs, and because only they would offer complete fuel packages.

Fuel Supply Considerations

IVO's fuel arrangement with the Soviets has been convenient for the utility, as it has eliminated the problems associated with coordinating a variety of suppliers for fuel cycle services—and it has eliminated the problem of long-term waste management. TVO must dispose of its own spent fuel (it is now building an on-site water pool facility scheduled for operation in 1988), and has criticized the international community for not cooperating to alleviate this problem for small nations such as Finland. In addition, TVO must accommodate the different requirements of several trading partners. For example, Canada requires that *all* Canadian-origin uranium that TVO ships into the USSR for enrichment must be removed, regardless of its form.

The major argument against IVO's fuel supply arrangement is that total reliance on the USSR could be crippling in the event of a severance of trade between the two nations. Likewise, the principal argument in favor of TVO's fuel supply situation is source diversity. Having good relations with its long-term suppliers, TVO has been able to adjust deliveries as requirements have changed. The utility has also reduced fuel costs by competing in open markets, including the spot market for U_3O_8. Neither IVO nor TVO has inventory problems or unfilled requirements in the near or intermediate term, and thus neither is currently an active participant in the nuclear fuel market.

Table 2

NUCLEAR POWER UNITS IN FINLAND

Unit	Utility	MWe Net	Type	Reactor Supplier	1983 Capacity Factor	COD[1]
Loviisa 1	IVO[2]	445	PWR	USSR	86.4	1977
Loviisa 2	IVO	445	PWR	USSR	90.4	1981
TVO 1	TVO[3]	660	BWR	Asea-Atom	83.6	1979
TVO 2	TVO	660	BWR	Asea-Atom	87.7	1982
Total MWe		2,210				

[1]COD = Commercial Operation Date.
[2]IVO = Imatran Voima Oy.
[3]TVO = Teollisuuden Voima Oy.

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Figure 1
FINLAND AND NEIGHBORING COUNTRIES

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AMPLIFICATIONS

FRENCH URANIUM INDUSTRY STRUCTURE

Report 187 (March 1984) contains an article on the nuclear power and uranium industries in France. A number of points in that article regarding ownership relations of companies involved in uranium-related businesses require clarification or amplification. Figure 2 on page 20 of this Report presents a revised and amplified diagram superseding Figure 2 of the referenced article.

1. The revised figure is expanded to show interests in fuel fabrication companies and related entities. Framatome, France's PWR manufacturer (owned 50 percent each by CEA and Creusot Loire), is a primary participant in the fuel fabrication business. The joint company Fragema (50 percent each Cogema and Framatome) designs, licenses and markets fabricated fuel for Framatome's PWRs.

The three fabrication plants in which Fragema fuel is manufactured are managed by FBFC (Societe Franco-Belge de Fabrication de Combustible). FBFC owns only two of those plants – one in Dessel, Belgium, and one in Romans, France; CFC (Cogema Framatome Combustible) owns the other one, at Pierrelatte. FBFC is owned by Eurofuel (87 percent) and MNM (Compagnie Belge de Metallurgie et Mecanique Nucleaires) (13 percent). Equity ownerships in Eurofuel and CFC are identical: Pechiney controls 50 percent of each, and both Framatome and Cogema have 25 percent of each.

2. Both Pechiney and Cogema have substantial interests in the European nuclear fuel transport company Transnucleaire (27 percent and 24.3 percent respectively). Other owners of Transnucleaire are the French bank Paribas (24.9 percent) and Nukem GmbH (24.3 percent).

3. The first paragraph on page 28 of the referenced article states that Cogema owns 12.14 percent of Imetal. Cogema actually has a net beneficial interest in Imetal of 24 percent, as Cogema owns 66 percent of Cogerap, which holds 36 percent of Imetal.

4. The fourth paragraph on page 28 of the referenced article describes the ownership of Amok, the principal owner and operator of the Cluff Lake project in Saskatchewan. The ownership relations of Amok as presented are outdated. Cogema owns 38 percent (not 30 percent), Pechiney 25 percent (not 45 percent), and Mokta 37 percent (not 25 percent) of Amok. Amok owns 80 percent of the Cluff Lake project; SMDC (Saskatchewan Mining Development Corporation) owns the other 20 percent.

5. Note that Nuexco's interpretation of Cogema's interest in Eurodif has been revised slightly from 61.14 percent to 61.5 percent. For more information about the ownership of Eurodif, see the article on Eurodif on page 26 of Report 188 (April 1984).

6. There is a typographical error in the first paragraph on page 28. The fourth sentence states that Pechiney owns shares in Amok in Canada, Comuf in Gabon, and Somair in Nigeria. Somair (Societe des Mines de l'Air) operates in *Niger*, not Nigeria.

CORRECTION

South Africa

1. The May Report (Number 189) contains a copy of a speech entitled *South Africa's Role in the Uranium Market*. There is a typographical error on the first page of the speech insert in the third paragraph under the heading "South Africa." The third line should indicate that South Africa's gross domestic product in 1983 was 88 billion Rands rather than 80 billion Rands.

2. There is also a typographical error in Table 1 of the speech, entitled "South African Economic Indicators." The table indicates that the Average Working Cost per Ton Ore Milled increased by 35 percent between 1973 and 1982; it should indicate an increase of 350 percent.

3. Another typographical error appears on page 16 in the *Recent Developments* section of the May Report, under the heading "First Quarter Production." Line two should state that South African production remained steady during the first quarter of 1984 rather than 1983.

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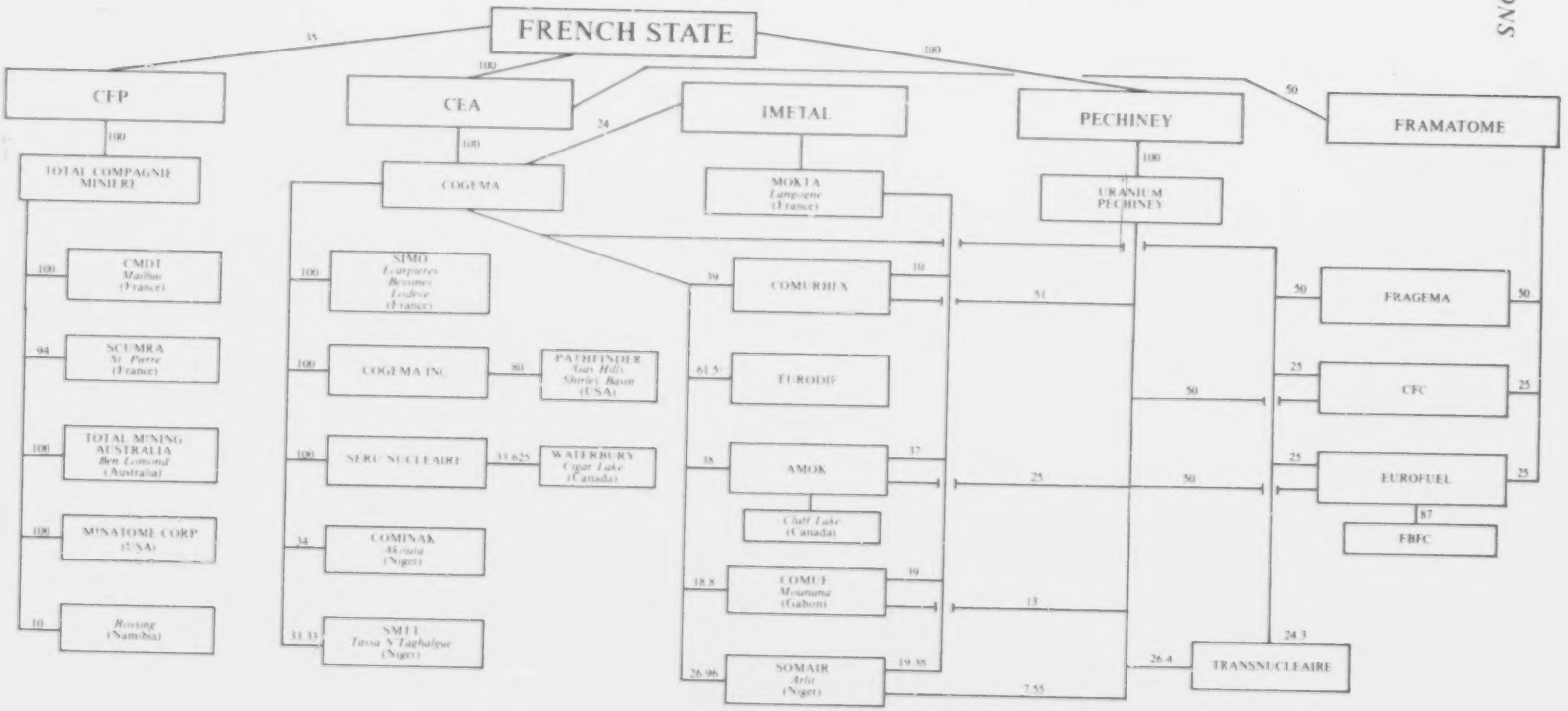
Figure 2

FRENCH OWNERSHIP INTERESTS IN URANIUM PROJECTS*



CEA	Commissariat a l'Energie Atomique	MOKTA	Compagnie Francaise de Mokta
CFC	Cogema Framatome Combustible	SCUMRA	Societe Centrale de l'Uranium et des Minerais et Metaux Radioactifs
CFP	Compagnie Francaise des Petroles	SERU	Societe d'Etudes et de Recherches d'Uranium
CMDT	Compagnie Miniere Dong-Trieu	SIMO	Societe Industrielle des Minerais de L'Ouest
COGEMA	Compagnie General des Matieres Nucleaires	SMTT	Societe Miniere de Tassa N'Taghalque
COMINAK	Compagnie Miniere d'Akouta	SOMAIR	Societe des Mines de L'Air
FBFC	Societe Franco-Belge de Fabrication de Combustible		

*This figure is a revised and amplified version of Figure 2 on page 29 of Report 187.

[1] Assumes Cogema controls share originally belonging to Iran Atomic Energy Organization. See pages 26-29 of Report 188.

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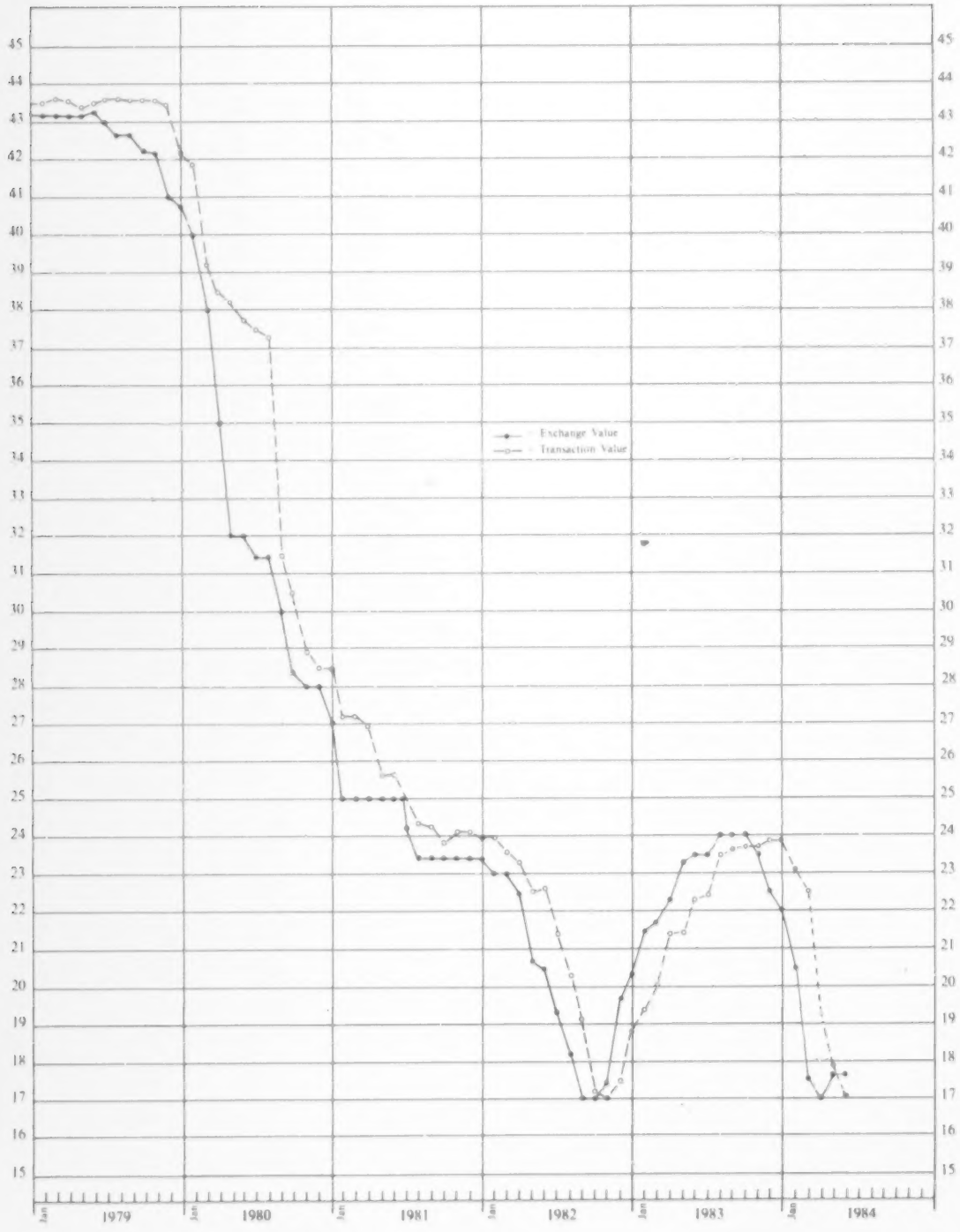
EXCHANGE AND TRANSACTION VALUES SINCE JANUARY 1979

Determined as of the last day of the month indicated



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HISTORICAL MARKET DATA

HISTORICAL EXCHANGE VALUES

Determined as of the last day of the month indicated (US Dollars/lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1968	—	—	—	—	—	—	—	6.35	6.35	6.40	6.45	6.50
1969	—	6.35	6.10	6.10	6.25	6.25	6.20	6.20	6.15	6.15	6.15	6.20
1970	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.20	6.15	6.15	6.15	6.15
1971	6.20	6.20	6.20	6.20	6.15	6.05	6.00	5.95	5.95	5.95	5.95	5.95
1972	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95
1973	5.95	6.00	6.10	6.20	6.45	6.50	6.50	6.50	6.50	6.50	6.75	7.00
1974	7.70	7.90	8.00	9.00	9.50	10.50	11.50	12.00	12.50	14.00	14.75	15.00
1975	16.00	16.00	18.00	20.00	21.00	23.00	24.70	26.00	26.00	28.50	30.00	35.00
1976	32.50	37.00	39.25	40.00	40.00	40.00	40.00	40.40	41.00	41.00	41.50	41.00
1977	41.35	41.50	41.60	41.60	42.00	42.25	42.25	42.25	42.40	42.75	43.20	43.20
1978	42.90	43.25	43.25	43.25	43.40	43.40	43.40	43.10	43.25	43.00	43.25	43.25
1979	43.25	43.25	43.25	43.25	43.25	43.00	42.70	42.70	42.20	42.20	41.00	40.75
1980	40.00	38.00	35.00	32.00	32.00	31.50	31.50	30.00	28.50	28.00	28.00	27.00
1981	25.00	25.00	25.00	25.00	25.00	24.25	23.50	23.50	23.50	23.50	23.50	23.50
1982	23.00	23.00	22.50	20.75	20.50	19.25	18.25	17.00	17.00	17.50	19.75	20.25
1983	21.50	21.75	22.25	23.25	23.50	23.50	24.00	24.00	24.00	23.50	22.50	22.00
1984	20.50	17.50	17.00	17.75	**17.75**							

HISTORICAL TRANSACTION VALUES

Determined as of the last day of the month indicated (US Dollars/lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	—	—	—	—	39.60	39.70	39.70	40.40	40.30	40.60	40.70	40.70
1977	41.30	41.30	41.40	41.50	42.80	42.90	43.00	42.60	42.50	42.80	42.90	42.90
1978	43.10	43.30	43.70	43.60	43.60	43.20	43.30	43.40	43.40	43.60	43.40	43.70
1979	43.60	43.80	43.70	43.40	43.60	43.70	43.70	43.60	43.60	43.60	43.50	42.30
1980	42.00	39.30	38.60	38.40	37.90	37.60	37.30	31.60	30.60	29.00	28.70	27.70
1981	27.20	27.20	27.00	25.70	25.70	24.50	24.40	24.30	23.90	24.10	24.10	24.00
1982	24.00	23.70	23.40	22.60	22.70	21.50	20.30	19.10	17.30	17.00	17.55	18.80
1983	19.35	20.00	21.35	21.40	22.35	22.45	23.50	23.60	23.65	23.65	23.85	23.85
1984	23.05	22.50	19.25	17.90	**17.00**							

HISTORICAL CONVERSION VALUES

Determined as of the last day of the month indicated (US Dollars/lb. U as UF_6)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1981	1.20	1.20	1.20	1.40	1.15	1.15	1.15	1.10	1.10	1.10	1.20	1.20
1982	1.20	1.20	1.20	1.20	1.00	1.00	1.00	0.90	1.10	1.60	1.45	1.45
1983	1.20	1.40	1.40	1.20	1.20	1.20	1.10	1.10	1.00	0.60	0.60	0.60
1984	0.60	0.30	0.80	0.80	**0.80**							

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AUSTRALIA

	Price Index of Materials Used in Manufacturing Industry—All Groups[1] (1969=100)	Award Rates of Pay Indexes Australia—Adult Males In Mining Wage Earners, Weekly Rates[2] (1976=100)
1972 Avg.	105.6	71.3
1973 Avg.	124.4	79.0
1974 Avg.	141.9	108.1
1975 Avg.	150.4	132.6
1976 Avg.	168.4	160.9
1977 Avg.	192.0	179.0
1978 Avg.[3,4]	198.5	190.0
1979 Avg.	248.8	127.9
1980 Avg.	321.8	140.8
1981 Avg.	355.3	154.1
1982 Avg.[5]	368.6	174.9
1983 Avg.	401.6	181.8
Jan 1983	385.7	179.6
Feb 1983	387.5	179.8
Mar 1983	397.4	179.7
Apr 1983	407.6	180.0
May 1983	415.1	180.1
Jun 1983	415.9	180.2
Jul 1983	408.8	179.9
Aug 1983	403.5	179.9
Sep 1983	403.4	179.8
Oct 1983	398.0	187.6
Nov 1983	396.0R	187.6
Dec 1983	399.7R	187.4
Jan 1984	399.6P	187.6
Feb 1984	—	187.4
Mar 1984	—	187.4

P = Preliminary R = Revised since last month

[1] Australian Bureau of Statistics, Canberra: "Price Index of Materials Used in Manufacturing Industry" (Catalogue No. 6411.0).
[2] Australian Bureau of Statistics, Canberra: "Award Rates of Pay Indexes, Australia" (Catalogue No. 6312.0). Figures for the latest fourteen months shown are subject to revision.
[3] Monthly data for 1970-78 appear on pages 4.7 and 4.8 of Report 138.
[4] Annual averages prior to 1979 reflect index base no longer in use.
[5] Monthly data for 1979-82 appear on page 35 of Report 184.

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GOVERNMENT STATISTICS

CANADA

	Industry Selling Price Index: Manufacturing[1] (1971=100)	Wage-earner Data: Average Hourly Earnings (C$)[2]						
		Uranium Mines (SIC 057)	Metal Mines (SIC 051-059)	Mines, Quarries and Oil Wells[3] (SIC 051-099)	Primary Metal Industries Non-ferrous[4] (SIC 296)	(SIC 296-298)	(SIC 298)	Chemicals and Chemical Products[5] (SIC 370-379)
1979 Avg.[6]	217.9	—	9.60	9.66	—	7.35	—	7.67
1980 Avg.	247.2	—	10.59	10.80	—	8.05	—	8.50
1981 Avg.	288.7	—	12.02	12.23	—	9.03	—	9.53
1982 Avg.[7]	288.8	—	13.74	13.92	—	9.98	—	10.63
1983 Avg.	298.8	—	14.69	14.30	—	—	—	11.17
Jan 1983	292.7	—	14.36	14.35	—	10.72	—	11.06
Feb 1983	293.5	—	14.24	14.28	—	10.74	—	11.06
Mar 1983[8]	295.2	16.79	14.84	14.48	—	10.93	—	11.21
Apr 1983	297.1	16.83	14.40	14.13	11.57	—	10.10	11.02
May 1983	298.5	17.02	14.50	14.10	11.39	—	9.82	10.97
Jun 1983	299.3	17.02	14.60	14.07	11.33	—	9.84	11.05
Jul 1983	300.4	16.48	14.35	13.93	11.70	—	9.83	11.04
Aug 1983	301.3	16.93	14.36	13.89	11.82	—	10.08	11.19
Sep 1983	301.1	17.66	14.90	14.41	11.99	—	10.32	11.29
Oct 1983	301.6	17.73	15.27	14.65	11.76	—	10.03	11.30
Nov 1983	301.8R	17.82	15.29	14.67	11.78	—	10.62	11.38
Dec 1983	302.8R	17.84	15.11	14.66	11.86	—	10.60	11.51
Jan 1984	305.4R	17.74	15.27	14.74	11.91	—	10.84	11.69
Feb 1984	306.6R	17.78	15.59R	14.90R	12.04R	—	10.82R	11.51R
Mar 1984	308.7	—	—	—	12.10P	—	10.95	11.58
Apr 1984	310.3	—	—	—	—	—	—	—

P = Preliminary R = Revised since last month

[1]Statistics Canada, Prices Division, Ottawa: "Industry Price Indexes" (Catalogue 62-011). Indexes for the most recent six months shown are subject to revision.

[2]Statistics Canada, Labour Division, Employment and Payrolls Section, Ottawa. "Employment, Earnings and Hours" (Catalogue 72-002).

[3]Reports 175 through 185 list this series title incorrectly as "Metal Mining, Including Milling (SIC 050-099)".

[4]Beginning with the April 1983 figure, Primary Metal Industries, non-ferrous is split into SIC 296 and SIC 298.

[5]Chemical and Chemical Products prior to April 1983 was SIC 370-379. The new series is from a new survey which includes all companies and is based on a 1970 classification. The old survey only included companies of 20 employees or more.

[6]Monthly ISPI for 1977 and 1978 appear on page 4.10 of Report 138, and monthly wage-earner data for 1973-78 appear on page 4.11 of Report 138.

[7]Monthly data for 1979-1982 appear on page 37 of Report 184. On that page, the wage earner index entitled "Metal Mining, Including Milling (SIC 050-099)" should read "Total Mining (SIC 051-099)".

[8]Beginning with the April 1983 figure, Wage Earner Data are based on a census of all companies employing 200 or more wage earners, *plus* a random survey of companies employing fewer than 200 wage earners. Prior to April 1983 only companies employing 200 or more wage earners are included in the Wage Earner Data.

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REPUBLIC OF SOUTH AFRICA

	Average Declared Working Costs per per Metric Ton of Gold Ore Milled (Rand)[1]	Tonnage-Weighted Index of Average Working Costs per Metric Ton of Gold Ore Milled (March 1982=100)[2]	Consumer Price Index[3] (1975=100)[4]	Producer Price Index All Groups[5] (1975=100)	Total Employment in Mining and Quarrying (Code 35)[6]	Total Salaries and Wages in Mining and Quarrying (1,000 Rand) (Code 40)[6]
1972 Avg.	8.79	—	113.3	63.9	623,067	443,933
1973 Avg.	10.51	—	124.1	72.3	684,743	572,133
1974 Avg.	13.18	—	138.5	85.3	674,140	761,596
1975 Avg.	16.71	—	157.2	100.0	639,473	1,003,617
1976 Avg.	19.30	—	174.7	115.1	671,240	1,212,983
1977 Avg.	23.87	—	194.4	130.0	712,006	1,420,670
1978 Avg.	27.14	—	137.2	142.7	664,571	1,537,169
1979 Avg.[7]	30.18	—	155.3	164.5	692,209	1,830,632
1980 Avg.[8]	35.53	—	176.7	192.1	714,379	2,279,615
1981 Avg.	41.89	—	206.5	218.3	728,506	2,820,505
1982 Avg.[9]	47.25	104.2	233.5	248.7	707,552	3,246,071
1983 Avg.	51.87	115.0	262.2	274.8	696,579	3,644,772
Jan 1983	—	—	249.0	264.9	688,030	289,075
Feb 1983	—	—	253.1	267.4	697,089	281,413
Mar 1983	50.35	111.2	255.9	269.1	695,976	290,586
Apr 1983	—	—	257.8	270.9	697,158	286,708
May 1983	—	—	259.7	274.1	701,712	295,701
Jun 1983	50.51	111.9	260.8	273.1	706,933	300,177
Jul 1983	—	—	262.5	273.7	704,202	314,566
Aug 1983	—	—	265.6	278.9	698,984	311,789
Sep 1983	52.92	117.4	267.3	279.4	696,435	312,264
Oct 1983	—	—	270.0	281.0	693,225	311,418
Nov 1983	—	—	271.4	281.6	688,459	317,485
Dec 1983	53.70	119.6	273.2	283.7	690,750	333,595
Jan 1984	—	—	274.7	283.3	689,807	326,619
Feb 1984	—	—	278.4	286.5	—	—
Mar 1984	55.30	123.1	281.9	288.0	—	—
Apr 1984	—	—	286.1	—	—	—

[1]Chamber of Mines of South Africa, Johannesburg; "Analysis of Working Results," published quarterly.
[2]Page 16 of Report 178 contains description and calculation of index, and page 24 of Report 178 lists figures for 1982.
[3]Republic of South Africa Department of Statistics, Pretoria; "Government Gazette," Consumer Price Index for Urban Areas."
[4]For annual averages prior to 1978, April 1970 = 100.
[5]Previously known as the Wholesale Price Index, now the Producer Price Index. The computation remains the same.
[6]Bulletin of Statistics, Department of Statistics, Pretoria.
[7]Historical data for the Average Declared Working Costs and Consumer Price Index 1970-1979 appear on page 4.9 of Report 140.
[8]Monthly data for Codes 35 and 40, 1977-1980, appear on page 28 of Report 157.
[9]Monthly data for 1979-82 appear on page 39 of Report 184.

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GOVERNMENT STATISTICS

UNITED STATES

	Producer Price Index[1]		Consumer Price Index[2]	GNP Implicit Price Deflator[3]	Gross Average Hourly Earnings of Production or Non-supervisory Workers (US$)[4]			
	Industrial Commodities (1967=100)	All Commodities (1967=100)	(1967=100)	(1972=100)	Metal Mining (SIC 10)	Primary Non-ferrous Metals (SIC 333)	Chemicals and Allied Products (SIC 28)	Electric and Electronic Equipment (SIC 36)
1972 Avg.	117.9	119.1	125.3	100.00	4.56	4.59	4.26	3.71
1973 Avg.	125.9	134.7	133.1	105.75	4.84	4.98	4.51	3.91
1974 Avg.	153.8	160.1	147.7	115.08	5.44	5.63	4.88	4.21
1975 Avg.	171.5	174.9	161.2	125.79	6.13	6.24	5.39	4.64
1976 Avg.	182.4	183.0	170.5	132.34	6.76	6.87	5.91	4.96
1977 Avg.	195.1	194.2	181.5	140.05	7.28	7.67	6.43	5.39
1978 Avg.[5]	209.4	209.3	195.4	150.42	8.23	8.56	7.02	5.82
1979 Avg.	236.5	235.6	217.4	163.42	9.27	9.50	7.60	6.32
1980 Avg.	274.8	268.8	246.8	178.64	10.26	10.63	8.30	6.94
1981 Avg.	304.1	293.4	272.4	195.51	11.55	11.98	9.12	7.62
1982 Avg.[6]	312.3	299.3	289.1	207.15	12.33	12.94	9.96	8.21
1983 Avg.	315.8	303.1	298.4	215.63	12.67	13.44	10.58	8.66
Jan 1983	313.9	299.9	293.1	—	12.63	13.33	10.34	8.53
Feb 1983	313.9	300.9	293.2	—	12.66	13.29	10.41	8.56
Mar 1983	313.5	300.6	293.4	212.83	12.48	13.35	10.39	8.60
Apr 1983	312.4	300.6	295.5	—	12.67	13.34	10.43	8.60
May 1983	313.6	301.5	297.1	—	12.55	13.62	10.50	8.60
Jun 1983	315.3	302.4	298.1	214.55	12.66	13.38	10.52	8.63
Jul 1983	316.5	303.2	299.3	—	12.68	13.56	10.58	8.69
Aug 1983	317.3	304.7	300.3	—	12.63	13.46	10.61	8.64
Sep 1983	317.1	305.3	301.8	216.44	12.71	13.47	10.69	8.75
Oct 1983	318.5	306.0	302.6	—	12.78	13.56	10.78	8.73
Nov 1983	318.3	305.5	303.1	—	12.72	13.56	10.86	8.78
Dec 1983	318.4	306.1R	303.5	218.53	12.85	13.34	10.89	8.86
Jan 1984	319.2	308.1	305.2	—	12.78	13.39	10.90	8.89
Feb 1984	320.4	308.8	306.6	—	12.88R	13.35R	10.89	8.87R
Mar 1984	321.9	311.1	307.3	220.52R	12.86P	13.32P	10.92R	8.90R
Apr 1984	322.5	311.4	308.8	—	—	—	10.98P	8.91P

P = Preliminary R = Revised since last month

[1]US Bureau of Labor Statistics, Washington, D.C.: "Producer Prices and Price Indexes," (formerly "Wholesale Prices and Price Indexes"). Producer Price Indexes are revised four months after they are first released to reflect the availability of late reports and corrections by respondents.

[2]US Bureau of Labor Statistics, Washington, D.C.: Consumer Price Index for All Urban Consumers, US City Average, All Items.

[3]US Department of Commerce, Washington, D.C.: Bureau of Economic Analysis, National Income and Wealth Division: "Survey of Current Business." The GNP Implicit Price Deflator is published quarterly, and seasonally adjusted.

[4]US Bureau of Labor Statistics, Washington, D.C.: "Employment and Earnings." 2. All data based on 1972 revision of SIC Manual. Data for 1970-1976 are adjusted to the March 1977 benchmark. Data for 1977-1978 are adjusted to the March 1979 benchmark. Data for January 1979 and beyond are adjusted to the March 1980 benchmark.

[5]Monthly data 1970-1978 for Producer Price Index-Industrial Commodities, Consumer Price Index, and Employment and Earnings SIC codes 10, 333, and 28, and quarterly data for GNP Implicit Price Deflator appear on pages 4.6-4.8 of Report 139.
Monthly data 1977-1978 for Employment and Earnings SIC Codes 10, 333, and 28 appear on page 33 of Report 147.
Monthly data 1970-1978 for Employment and Earnings SIC Code 36 appear on page 23 of Report 154.
Monthly data 1977-1980 for Producer Price Index-All Commodities, appear on page 21 of Nuexco Report 158.

[6]Monthly data 1979-1982 for all listed indices appear on page 41 of Report 184.

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